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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,116	05/22/2000	Matthew Lennig	003932.P014	2810

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EXAMINER	
AZAD, ABUL K	

ART UNIT	PAPER NUMBER
2654	//

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/576,116	LENNIG, MATTHEW	
	Examiner	Art Unit	
	ABUL K. AZAD	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-5,8-20,26-31,34-37 and 39-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14-20 and 41* is/are allowed.

6)☒ Claim(s) *2-5,8-13,26-31,34-37,39 and 40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This action is in response to the communication filed on February 18, 2004.

2. Claims 2-5, 8-20, 26-31, 34-37 and 39-41 are pending in this action. Claims 8, 31 and 39 have been amended. Claims 1, 6, 7, 21-25, 32, 33 and 38 have been canceled.

3. The applicant's arguments with respect to claims 2-5, 8-20, 26-31, 34-37 and 39-41 have been fully considered but they are not deemed to be persuasive. For examiner's response to the applicant's arguments or comments, see the detailed discussion in the Response to the Arguments section.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2-5, 8-13, 26-31, 34-37 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peackham et al. (EP 0 424 071) in view of Lee (US 6.067,520).

As per claim 8, Peckham teaches, "a method comprising":

"inputting speech representing an utterance and having an intonation, the utterence including a plurality of syllables" (Page 5, lines 32-33, particularly reads on "the input words are analysed to extract normalized cepstral coefficients and pitch" where "intonation" reads on "pitch"); and

"identifying an endpoint of the utterance based on the intonation" (Page 14, lines 55-56, particularly reads on "the use of pitch information, preferably in combination with energy, in identifying the start and end points of utterances", where "intonation" reads on "pitch");

"identifying the endpoint of the utterance based on a length of time for which an energy value of the speech has remained below a predetermined energy value" (Page 8, lines 50-56, particularly reads on "this system looks backwards in time from the beginning of the period and forwards in time from the end of this period to discover the points where the energy falls to 10 per cent of the maximum values. This points are used to identify the start and end of the spoken word for analysis").

As per claim 8, Peakman does not explicitly teach identifying the endpoint of the utterance based on the duration of the final syllable of the utterance. However, Lee teaches, identifying the endpoint of the utterance based on the duration of the final syllable of the utterance (col. 9, line 62 to col. 10, line 29). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to identify en endpoint of a continues speech using the final syllable of the utterance as taught by Lee because an skilled artisan would readily recognized that would particularly detect the end point of the utterance, which helps enhancement of the recognition process.

As per claim 2, the claim limitation is rejected based on the rational given to claim 8 above, and further Peckham teaches, "wherein said identifying an endpoint of the utterance based on the intonation comprises comparing the intonation with an intonation

model" (Page 14, lines 36-56, particularly reads on "such as pitch and delta cepstrum may be used in the enrolment and verification process").

As per claim 3, Peckham teaches, "further comprising determining the intonation by computing the fundamental frequency of the utterance" (Page 5, lines 32-33, particularly reads on "the input words are analysed to extract normalized cepstral coefficients and pitch" where pitch by definition is the fundamental frequency, see text book of Deller et al.).

As per claim 4, Peckham teaches, "wherein said determining the intonation comprises using an intonation model to determine the intonation" (Page 14, lines 36-56, particularly reads on "such as pitch and delta cepstrum may be used in the enrolment and verification process").

As per claims 26-31, 34-37 and 39-40, they are interpreted and thus rejected for the same reasons set forth in the rejection of claims 2-4 and 8, because essentially they have similar limitations and scope.

As per claim 9, Peckham teaches, "a method of operating an endpoint detector", the method comprising:

"inputting speech representing an utterance, the utterance having an intonation" (Page 5, lines 32-33, particularly reads on "the input words are analysed to extract normalized cepstral coefficients and pitch" where "intonation" reads on "pitch"); and

As per claim 9, Peakham does not explicitly teach, "comparing the intonation of the utterance with an intonation model";

"determining a probability based on a result of said comparing"; and

"identifying an endpoint of the utterance based on the probability".

However, Lee teaches, "comparing the intonation of the utterance with an intonation model" (col. 9, lines 62 to col. 10, line 30, here "intonation model" reads on "tone model");

"determining a probability based on a result of said comparing" (col. 9, lines 62 to col. 10, line 30, here possible end point is probability of the comparing results); and

"identifying an endpoint of the utterance based on the probability" (col. 9, lines 62 to col. 10, line 30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Lee's teaching in the invention to identify endpoint of the utterance using tone model to calculate probable endpoint based on the comparing so that quickly an utterance is recognized based on the determination of starting and endpoint of the utterance.

As per claim 10, the claim limitation is rejected based on the rational given to claim 9 above, and further Peckham teaches, "further comprising determining the intonation of the utterance as a function of the fundamental frequency of the utterance" (Page 5, lines 32-33, particularly reads on "the input words are analysed to extract normalized cepstral coefficients and pitch" where pitch by definition is the fundamental frequency, see text book of Deller et al.).

As per claim 11, the claim limitation is rejected based on the rational given to claim 9 above, and further Peckham teaches, "determining a period of time that has elapsed since a value of the speech dropped below a threshold value" (Page 8, lines

50-56, particularly reads on "this system looks backwards in time from the beginning of the period and forwards in time from the end of this period to discover the points where the energy falls to 10 per cent of the maximum values. This points are used to identify the start and end of the spoken word for analysis"); and

"wherein said identifying an endpoint of the utterance comprises identifying the endpoint of the utterance further based on the period of time" (Page 8, lines 50-56, particularly reads on "this system looks backwards in time from the beginning of the period and forwards in time from the end of this period to discover the points where the energy falls to 10 per cent of the maximum values. This points are used to identify the start and end of the spoken word for analysis").

As per claim 12, Peakman does not explicitly teach identifying the endpoint of the utterance based on the duration of the final syllable of the utterance. However, Lee teaches, identifying the endpoint of the utterance based on the duration of the final syllable of the utterance (col. 9, line 62 to col. 10, line 29). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to identify en endpoint of a continues speech using the final syllable of the utterance as taught by Lee because an skilled artisan would readily recognized that would particularly detect the end point of the utterance, which helps enhancement of the recognition process.

As per claim 13, the claim limitation is rejected based on the rational given to claim 12 above, and further Peckham teaches, "wherein said identifying an endpoint of the utterance comprises identifying the endpoint of the utterance further based on a period of time for which an energy value of the speech has remained below a threshold

value" (Page 8, lines 50-56, particularly reads on "this system looks backwards in time from the beginning of the period and forwards in time from the end of this period to discover the points where the energy falls to 10 per cent of the maximum values. This points are used to identify the start and end of the spoken word for analysis").

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peckham et al. (EP 0 424 071) in view of Lee (US 6,067,520) as applied to claim 8 above, and further in view of Zhao et al. (US 6,480,823).

As per claim 5, the claim limitation is rejected based on the rational given to claim 1 above, further, Peckham teaches, "wherein said identifying the endpoint of the utterance comprises identifying the endpoint of the utterance based on a plurality of knowledge sources, wherein one of the knowledge sources is intonation" (Page 8, lines 29-56, where plurality of knowledge sources are pitch (intonation), energy and time etc.). Peckham does not teach referencing the input speech against a histogram based on training data for each of the knowledge sources. However, Zhao teaches, a histogram database (Fig. 1, elements 38 and 40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to build a histogram database fore each of the knowledge source because Zhao teaches the invention will detect both the beginning and end of speech as well as handling situations where the beginning of speech may have been lost through truncation will provide a better detection of speech in the noise condition (col. 1, lines 54-58).

Allowable Subject Matter

7. Claims 14-20 and 41 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach or fairly suggest "computing an overall end-of-utterance probability comprises computing the overall end-of-utterance probability as a function of the first, second, and third end-of-utterance probabilities".

Response to Arguments

9. The applicant argues, "furthermore, Lee at col. 9, line 62 to col. 10, line 29, only discloses using statistical (probable) minimum and maximum duration of typical syllable (col. 10, line 2-5). There is no suggestion of using the duration of the final syllable of an utterance for the endpoint detection".

The examiner disagrees with the applicant's assertion because Lee teaches to detect endpoint of an utterance based on several factors, including duration of each syllable in the utterance, where final syllable also includes in the start to end of the whole utterance of speech (see col. 10, lines 24-28).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re*

Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, detect the endpoint of the utterance, which helps enhancement of recognition process (see col. 3, lines 15-20).

10. The applicant further argues, "Lee does not disclose or suggest determined a probability based on a result of comparing the intonation of the utterance with an intonation model, and then identifying an endpoint of the utterance based on the probability".

The examiner note that above limitation is teaches at col. 9, line 62 to col. 10, lines 30. Here endpoint is detected using tone model as well as individual syllable.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-3838.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Richemond Dorvil**, can be reached at **(703) 305-9645.**

Any response to this action should be mailed to:

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Or faxed to:

(703) 872-9314

(For informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center's Customer Service Office at telephone number **(703) 306-0377.**

Abul K. Azad

April 26, 2004

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER